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Publication Number: WO/2000/005883 International Application No.:
PCT/US1999/015090
Publication Date: 03.02.2000 International Filing Date: 02.07.1999
Chapter 2 Demand Filed: 18.02.2000

Int. Class.: G11B 27/10 (2006.01), G11B 27/30 (2006.01), G11B 27/32 (2006.01), G11B 27/34 (2006.01), H04N 5/93 (2006.01), H04N 5/85 (2006.01), H04N 9/804 (2006.01), H04N 9/806 (2006.01), H04N 9/82 (2006.01)

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Priority Data: 60/093,344 20.07.1998 US
09/223,937 31.12.1998 US

Title: DIGITAL VIDEO APPARATUS USER INTERFACE

Abstract:

A method and apparatus for processing information stored on a storage medium, such as a digital video disk (21), involves accessing information stored on the medium and determining whether information stored on the storage medium includes unrated program information. If so, a user (31) is given the opportunity to override a control condition of the system that prevents playback of unrated program information. If override is selected, playback of the unrated program information is enabled and, upon completion of playback, the control condition of the system may be restored to prevent playback of other unrated program information. Override may be conditioned upon the user first entering a password. The mode of operation that permits override of the control condition for preventing playback of unrated program information mode of operation may be selectively enabled.

Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW.

African Regional Intellectual Property Org. (ARIPO) (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW)

Eurasian Patent Organization (EAPO) (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM)

European Patent Office (EPO) (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE)

African Intellectual Property Organization (OAPI) (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Publication Language: English (EN)

Filing Language: English (EN)

DIGITAL VIDEO APPARATUS USER INTERFACE The present invention relates to a user interface for a digital video apparatus, and in particular, a user interface for a digital video apparatus capable of restricting playback of stored video and audio information in response to program related information, such as parental control ratings, included with the video and audio information.

Video signal processing systems that utilize storage media having digitally compressed video and audio information recorded thereon can give the user a vast number of options for controlling playback of a video title stored on such a media. One such system that is gaining rapid popularity comprises a video disc player adapted to process information stored in accordance with the digital video disc (DVD) specification. The information on a DVD formatted disc is recorded as discrete packets of data, in accordance with the applicable video and audio data compression standards, wherein designated packets carry data associated with various data streams, such as alternative video angles, audio tracks, subpicture streams, etc. A video disc player reading a DVD formatted disc may be controlled to display certain packets of data and skip over others. A single disc may allow playback of multiple camera angles, story endings, scenes according to a ratings content, etc. Using this capability, the DVD system can be used to prevent unauthorized access to information on a particular disc as well as seamlessly provide multiple variations of a video title in accordance with user commands.

One useful application of the restricted access and seamless branching feature of the DVD system relates to parental control of material that can be played from a designated disc player. Typically, a DVD player allows the user to select a parental control rating, usually varying from 1 to 8 wherein 1 is the least restrictive and 8 is the most restrictive. This user selected parental rating is used to establish a control condition of the system that automatically restricts the playback of discs, video titles on a disc, or scenes in a video title using that disc player based on the parental rating authored on the disc or video title. Such parental ratings generally correspond to the movie rating of the Motion Picture Association of America (MPAA).

During disc playback, the DVD player compares the user selected parental rating against the parental rating assigned to the disc or video title and only allows playback of the disc, video title or certain scenes from the video title if the user selected parental rating equals or exceeds the parental rating of the disc or video title. In the case of multiple playback sequences, the DVD player follows the playback sequence having a parental rating that corresponds to the user selected parental rating.

Ordinarily, a user must call up and navigate through the disc player's set up menu to select or change the user selected parental rating. Once selected, the user selected parental rating applies to all the discs played back using that disc player.

However, the parental control feature described above is not effective when the disc, or a video title on the disc, or a portion of a program or information on a storage medium does not have a parental rating associated with it. In such a case, a disc player will usually playback the contents of the disc, or video title set, without any parental ratings restriction. However, under some

circumstances a user may wish to restrict access to an unrated video disc, or certain video titles on the disc, or a particular portion of a disc, for example personally recorded discs or video titles. The present invention recognizes that it is desirable to provide a user interface, method and apparatus which allows a user to apply a lockout feature with respect to an unrated disc or video title or portion of information stored on a storage medium to restrict access to the contents of the unrated information.

In accordance with the present invention, a user interface, method and apparatus is provided which permits a user to establish a system lock condition in a disc player with respect to unrated discs or video titles or portions of stored information thereby preventing that disc player from playing unrated discs or video titles or programs or portions of stored information. The system provides the user with an opportunity to dynamically override the system lock condition to unlock the player so that the disc player can playback a selected unrated disc or video title or portion of stored information. In one mode of operation, the system automatically reestablishes the system lock condition locking the player for unrated information after completing playback of the selected unrated disc, video title, or portion of the stored information. In another mode of operation, the player remains unlocked following completion of playback of the unrated information.

The invention will be described with reference to the accompanying drawings, wherein: Fig. 1 is a block diagram of a video processing system in accordance with the DVD specification; Fig. 2 is a block diagram of a digital video disc player suitable for implementing the unrated disc lockout feature of the present invention; Fig. 3 is a block diagram illustrating navigation between the disc player domain and the DVD domain ; Fig. 4 is a detailed block diagram illustrating navigation between the disc player domain and the DVD domain; Fig. 5 is an example of an on screen information display that provides player and disc status information; Fig. 6 is a diagram of a data structure in accordance with the DVD format; Fig. 7 is a block diagram of a presentation structure in accordance with the DVD format; Figs. 8 a-b are block diagrams illustrating sample playback options available in the DVD format; Fig. 9 is an on screen display suitable for overriding the unrated disc lockout feature of the present invention; Fig. 10 is a flowchart illustrating the steps for implementing the dynamic override of the unrated disc lockout feature of the present invention; and Fig. 11 is a flowchart illustrating steps for implementing another embodiment of the dynamic override of the unrated disc lockout feature of the present invention.

Although the exemplary embodiment is described with reference to a digital video apparatus adapted to read compressed video and audio data from a disc and to process the data in accordance with the DVD specification, it is to be understood that the present invention may be used in any video processing apparatus capable of processing digital video and audio information, wherein program related information included with the video and audio information can be used to selectively restrict the playback of the video and audio information on the disc.

Also, it is to be understood the term "unrated disc lockout" refers to locking the disc player to prevent playback of unrated discs and/or unrated video titles.

Fig. 1 is a block diagram of video processing system 20 in accordance with the DVD specification. In particular, Fig. 1 illustrates the basic relationship between presentation data and navigation data in video processing system 20 comprising disc player 24 and DVD formatted disc 21. The contents of disc 21 are read by disc player 24 and displayed on display 28 in accordance with commands from user control device 31. Disc 21 includes presentation data 22 and navigation data 23, wherein presentation data 22 comprises the data to be played back in the form of video, audio, subpictures, etc., and navigation data 23 comprises control data for determining how presentation data 22 is displayed. Disc 21 may also include data to generate a menu for allowing the user to interactively control the manner in which presentation data 22 is displayed.

Disc player 24 includes presentation engine 25 and navigation manager 26, which may be implemented in microcontroller 40 described with respect to Fig. 2.

Presentation engine 25 receives presentation data 22, and under control of navigation manager 26, provides an output to display 28. Display 28 comprises audio output device 30 and video display 29. Navigation manager 26 includes user interface control 27 which provides a user interface, creates menus, etc. Navigation manager 26 uses information from navigation data 23 to control the output of presentation engine 25 to display 28. User control device 31 is coupled to navigation manager 26 and allows for user entry of data to control the manner in which navigation manager 26 controls presentation engine 25.

Fig. 2 is a block diagram showing the basic elements of an exemplary digital video disc player suitable for use in system 20 of Fig. 1 and for implementing the unrated disc lockout feature of the present invention. The construction and operation of these elements are known to one of ordinary skill in the art and will not be discussed in detail here. Disc player 24 comprises motor and pickup assembly 26 which, under the control of servo processor 29, spins the disc and reads the information stored thereon. Preamp 27 and DVD data processing unit 28 translate the electrical pulses from motor and pickup assembly 26 into digital data that can be further processed by digital audio/video decoder unit 30. DVD data processing unit 28 typically performs functions such as demodulation, error correction and descrambling of the raw data read from the disc so that the data is in a suitable format for decoder unit 30.

Decoder unit 30 receives the demodulated, error corrected and descrambled data, processes the data, and provides the appropriate video and audio signals to a display unit, such as a television set. Decoder unit 30 comprises data stream demultiplexer 32 which demultiplexes the data from data processing unit 28 into a plurality of separate data streams, including a video stream, an audio stream and a subpicture stream, and provides the data streams to their respective data decoders. Video decoder 31 receives the video stream and provides a video signal to mixer 33. Subpicture decoder 34 receives the subpicture stream and provides data to on screen display (OSD) control 35 which provides OSD video signals to mixer 33. The combined video signal from mixer 33 is provided to NTSC/PAL encoder 42 which provides a video signal that conforms to the appropriate video signal standard to a video display device. Audio decoder 36 receives the audio streams from data stream demultiplexer 32 and provide the appropriate audio signals to an audio system.

Microcontroller 40 controls the operation of disc player 24.

Microcontroller 40 is coupled to user control device 31, which may comprise IR remote control devices, front panel buttons or the like, and translates data from user control device 31 to control the operation of the various elements of disc player 24 described above. Typically, microcontroller 40 is also configured to control various access features of disc player 24 including, but not limited to, parental lock out, decryption of encrypted discs, dialing remote controllers to gain access to encrypted discs. Microcontroller 40 may be embodied in various forms, including, but not limited to, a dedicated integrated circuit, or a part of a decoder/controller unit.

Microcontroller 40 may be comprised of one of a plurality of suitable controller units, including, but not limited to STI 5500, manufactured by SGS Thomson.

Fig. 3 illustrates the basic navigation scheme between the video player domain 60 and the disc domain 62. Entering a PLAY command or calling for guide data moves control to disc domain 62, wherein title playback proceeds as indicated by title playback block 63 or a title menu is displayed as indicated by title menu block 64. On screen selections made from the title menu controls the playback sequence.

A STOP command returns the user to player domain 60.

A more detailed illustration of the navigation scheme between player domain 60 and disc domain 62 is shown in Fig. 4. As shown in Fig. 4, player domain 60 includes player menu 61 for allowing the user to select certain operating conditions for the player, for example parental control ratings. Also, DVD domain 62 includes title menu 64 for providing information about the respective video title. On screen selection from title menu 64 may transfer the user to title playback block 63 which includes provisions for root menu 65. Root menu 65 may be authored onto a disc to provide information about available options on the disc including, but not limited to, subtitles, audio tracks and camera angles.

If the disc does not include a root menu 65 authored thereon, it is advantageous to include a provision for generating an informational display, developed from the actual video and audio information stored on the disc, which identifies and displays the available options to the user. Such a provision is indicated by information displays block 66. Fig. 5 illustrates an example of an informational display 75 that may be used for identifying and displaying the options available on the disc to the user when a root menu 65 is not available from DVD domain 62.

Alternatively, disc player 24 may be configured to allow the user to select information display 75 rather than root menu 65 even if root menu 65 exists in DVD domain 62.

As shown in Fig. 5, information display 75 comprises text display portion 76 surrounded by a plurality of displays and buttons 77-87 for providing information about the contents of the disc and allowing the user to make various selections to control various aspects of the disc playback. Timer display 77 provides time information regarding the disc being played and transport display

78 shows the direction and speed of the disc drive. Button 79 provides access to information regarding the number of the current title. Button 80 provides access to information regarding the number of the current chapter. Button 81 allows the user to change the playmode setting of disc player 24. Button 82 allows the user to access the root menu of the disc. Button 83 provides access to information regarding subtitles on the disc. Button 84 allows the user to select from available audio streams. Button 85 allows the user to select from available camera angles. Button 86 allows the user to select from available repeat modes. Button 87 allows the user to set bookmarks and jump to a previously set bookmark.

Fig. 6 illustrates a data structure in accordance with the DVD specification and suitable for use in video processing system 20. The data structure is hierarchical, wherein each data block is divided up into component data blocks, which are further divided into smaller component data blocks. At the top of the hierarchy is a video manager block and one or more video title sets. The video manager includes a control data block having control information applicable to the disc and a disc menu. Each video title set corresponds to a designated program unit, for example, a movie or an episode of a television show.

Each video title set includes a control data block having control information applicable to the video title set, a title menu, followed by the title content, and a control data backup block. The title menu and the title content are each comprised of video object sets, wherein each video object set comprises a plurality of video objects. Each video object is comprised of a plurality of cells and each cell is in turn comprised of a plurality of video object units. Each video object unit is comprised of a navigation pack and a plurality of packs, which are subdivided into a plurality of packets. The smallest addressable block of data is a cell, wherein a cell may hold data for as short as a single scene or as long as an entire movie.

In implementing the parental control feature, a parental rating may be encoded in the video manager to control access to the entire disc or may be encoded in the control data block of each respective video title set to control access to a particular video title set. If the parental control is encoded in the video manager, disc player 24 only allows appropriate playback of the disc when the user selected parental rating equals or exceeds the parental rating encoded in the video manager block. If the parent rating is encoded in the control data block of the video title set, disc player checks the parental rating of each video title set prior to playback of that video title set. The relationship of the present invention with regard to the encoded parental ratings is discussed further below.

Fig. 7 illustrates a presentation structure in accordance with the DVD format and suitable for use in video processing system 20. The presentation structure is overlaid onto the data structure shown in Fig. 6. The presentation structure and the data structure intersect at the cell level. As shown in Fig. 7, each video title set may be comprised of a plurality of parental blocks 90, wherein each parental block is comprised of one or more program chains (PGCs) 92. Each program chain contains program chain information block 94 and video object set 96.

Program chain information block 94 includes one or more programs (PGs) 96, each of which

include a collection of pointers to cells 98 contained in respective video objects 100 in video object set 96. Programs 96 link cells 98 together and indicate the order in which they are to be played. Therefore, by providing the appropriate pointers to the desired cells, a program chain 92 provides a particular playback sequence and a collection of program chains 92 provide a playback sequence for the video title set. It can be seen that multiple parental blocks, each containing different program chains, may be created to generate multiple playback sequences corresponding to different parental control ratings.

Different versions of a video title set, corresponding to different parental control ratings, may be provided by the disc author to enable disc player 24 to seamlessly branch between various scenes to provide multiple playback sequences for a particular video title set. By setting the user selected parental rating to a low level, objectionable scenes may be skipped over for younger viewers, while an unedited version of the program may be viewed by older viewers by setting the user selected parental rating to a higher level. The seamless branching is achieved by linking and displaying the desired cells, programs and program chains as desired.

Figs. 8 a-b illustrate a single playback sequence and a multiple playback sequence provided by seamlessly branching between groups of program chains. In Fig. 8a, the disc only provides for a single playback sequence which comprises program chain #1, wherein the playback proceeds in one continuous sequence. In Fig. 8b, multiple playback sequences are provided, wherein a G-rated sequence would follow program chains 1,2,4 and 7, while a PG-rated playback sequence would follow program chains 1,3,5 and 8, and an R-rated playback sequence would follow program chains 1,3,6 and 9.

As noted above, parental control can also be implemented by completely preventing access to a disc based on a parental rating encoded in the video manager or to a video title set based on a parental rating encoded in the control data block of a video title set. In that case, disc player 24 compares the user selected parental rating against the encoded parental rating and determines whether playback of the disc or video title set is permitted. If the user selected parental rating equals or exceeds the parental rating of the disc or video title set, disc player 24 proceeds to playback the selected disc or video title set. If the user selected parental rating is below the parental rating of the disc or video title set, disc player 24 prevents playback of that disc or video title set.

As noted above, the present invention recognizes the parental control feature described above does not apply when a disc or a video title set is unrated or does not have a parental rating associated with it. The present invention further recognizes that a user may wish to apply the parental control feature to unrated discs or video title sets thereby preventing playback of such discs or video title sets. As such, disc player 24 provides a user with the option of locking disc player 24 with respect to unrated discs or video title sets. This option may be implemented in a number of ways, including, but not limited to, providing an option in the player set up menu, in the parental control set up sub-menu, to lock disc player 24 for unrated discs and/or video title sets. The set up menu may be generated under the control of microcontroller 40 as known in the art. Preferably, this option would be selected in the same manner in which the user selects a particular parental rating

for disc player 24. Once the unrated disc lockout feature is selected, the control system of disc player 24 establishes a system control condition which automatically locks, or prevents playback, of all discs or video title sets which do not have a parental rating associated with it.

However, after the unrated disc lockout feature has been selected, the user may wish to dynamically override the lockout feature during playback of a selected disc or video title set. In such a case the user may wish to avoid the inconvenience of having to stop the disc, call up and navigate through the player set up menu to disable the lockout feature, play the disc or video title set, and then reset the unrated disc lockout feature after playback is complete. Therefore, the present invention also allows the user to dynamically override the unrated disc lockout feature, wherein disc player 24 automatically resets the unrated disc lockout feature after playback of the selected disc or video title set is complete.

A suitable on screen display for prompting user override of the unrated disc lockout feature is shown in Fig. 9. Display 110 indicates that the selected disc or video title set is an unrated disc or video title set and that the unrated disc lockout feature must be overridden to play the selected disc or video title set. Display 110 asks the user to select button 112 to override the unrated disc lockout feature and to select button 114 to cancel the current selection. The selection and navigation between the two buttons may be performed using any conventionally known user interface methods, for example, using cursor control buttons and an ENTER key on a remote control.

If the user selects button 112 to accept the override option, disc player 24 displays a password challenge. This password challenge may take many forms, including, but not limited to entering a numerical code selected by the user upon initial setup of disc player 24. If the user successfully passes the password challenge, disc player 24 automatically overrides the unrated disc lockout feature and resumes playback of the selected disc or video title set. If the user selects the cancel selection button 114, disc player 24 stops the disc and waits for further commands. It is to be understood that the user interface described above may be implemented using techniques known to one of ordinary skilled in the art, for example, programming microcontroller 40 to implement the various steps.

A flowchart illustrating the steps for implementing the dynamic override of the unrated disc lockout feature is shown in Fig. 10. In step 122, disc player 24 waits for the user to send a PLAY command and upon receiving the PLAY command searches the disc or video title set for a parental rating associated with the disc or video title set. If disc player 24 determines in step 123 that the disc or video title set includes a parental rating, disc player 24 proceeds to playback the selected disc or video title set in accordance with the parental rating in step 124.

If disc player 24 determines in step 123 that the selected disc or video title set does not include a parental rating, disc player 24 displays an on-screen display message, such as the one shown in Fig. 9, and waits user response. If disc player 24 determines in step 126 that the cancel selection option is selected, disc player 24 goes to step 127 and waits for further user commands.

If disc player determines in step 126 that the user has selected the override option, disc player 24 issues a password challenge in step 128. If disc player 24 determines in step 129 that the password entered by the user is incorrect, disc player 24 determines in step 130 whether the maximum number of password attempts has been entered. If so, disc player 24 stops the disc and waits for further commands in step 127. If not, disc player 24 reissues the password challenge in step 128 and waits for the user to enter another password. Alternatively, disc player 24 may allow the password attempt for a predetermined period of time or for some combination of time and number of attempts.

If the disc player determines in step 129 that the password is correct, disc player 24 overrides the unrated disc lockout feature and proceeds to playback the disc or video title set in step 131. In step 133, the system resets the unrated information lockout feature upon completion of playback of the unrated information.

In this way, a user can override the unrated disc lockout feature for a selected disc or video title set or portion of the stored information and reset the lockout feature after completing playback without having to call up and navigate through the player set up menu. However, modifications of the arrangement in Fig. 10 are possible.

Specifically, step 133 could be optional. That is, in one embodiment or mode, the system may be reset as described upon following playback as shown in step 133. In another mode or embodiment, the unlocked condition for unrated information that is established by the override operation may be maintained following completion of playback of the unrated disc, title, program or portion of the information for which override was activated. Controlling the mode which establishes whether step 133 occurs or not can be accomplished by setting the desired mode during setup, e. g., using a remote control to select desired features from an on-screen display showing a menu of modes and options.

Fig. 11 shows, in flowchart form, another embodiment of a method for controlling a system in accordance with principles of the invention. Steps in Fig. 11 which have the same reference number as in Fig. 10 operate in a similar manner to the corresponding step in Fig. 10 as described above and will not be described again here. The arrangement depicted in Fig. 11 provides for selectively enabling the mode of operation in which user override of an unrated-information lock occurs.

Specifically, Fig. 11 includes step 135 following step 123 which tests to determine if the unrated-lock-override mode is enabled. If so (a "YES" result at step 135), step 135 is followed by step 125 and operation to override the unrated lock control condition progresses as described with respect to Fig. 10. If unrated lock override is disabled (a "NO" result at step 135), then step 135 is followed by step 134 which exits the routine without providing the user an opportunity to override the unrated information lock. Override could then occur prior to activation of the playback mode by navigating the usual setup menus as described above if a user desires.

Enabling/disabling of the unrated information override mode may occur by selecting the desired

mode on a setup option display created by the system's on- screen display processor during a setup mode of operation. The setup mode of operation, which enables controlling various features such as video processing characteristics, sound characteristics, closed captioning, etc., in addition to override on-the-fly mode enable/disable, may be activated, for example, by pushing a control button on a remote control. Desired features/modes/settings are selected from the displayed setup menu by using buttons on the remote control.

It will be apparent to those skilled in the art that although the present invention has been described in terms of an exemplary embodiment, modifications and changes may be made to the disclosed embodiment without departing from the essence of the invention.

It is herein recognized that the unrated disc lockout feature may be implemented using any one of a number of conventionally known methods, or combination of methods, for controlling the various elements of disc player 24 described above, for example by using embedded software in a microcontroller.

Also, the present unrated disc lockout feature may be implemented for any signal processing system which can be configured to selectively restrict access in response to the presence of parental control ratings, or other program related information, included with stored audio, video and subpicture data stored, for example, on storage media including video tape, DVD video systems, DVD audio systems, DVD-ROM systems, Laser Disc systems, etc. Therefore, it is to be understood that the present invention is intended to cover all modifications as would fall within the true scope and spirit of the present invention.

CLAIMS

Claims 1. A method for controlling a system for processing information stored on a storage medium comprising the steps of: (A) determining whether information stored on the storage medium lacks rating information identifying a rating for a program stored on the storage medium; (B) providing to a user an opportunity to select whether to override a system lock disabling playback of unrated information stored on the storage medium responsive to determining that the stored information lacks rating information; and (C) enabling playback of the program responsive to user override of the system lock.

2. The method of claim 1 wherein step (C) is followed by the step of disabling playback of unrated information stored on the storage medium upon completion of play back of the program.

3. The method of claim 2 wherein step (A) is preceded by the step of determining whether a mode of operation enabling user override of the system lock is enabled.

4. The method of claim 3 wherein step (C) is preceded by the step of prompting a user to enter a password needed to enable overriding the system lock.

5. The method of claim 4 wherein the system comprises a DVD player and the storage medium comprises a DVD disc.
 6. A method of controlling a system for processing information on a digital video disk comprising the steps of: (A) determining whether the digital video disk includes unrated program information; (B) prompting a user during the play mode of operation to select whether to override a control condition of the system to enable playback of the unrated program information; and (C) enabling playback of the unrated program information in response to the user selecting to override the control condition of the system.
 7. The method of claim 6 wherein step (C) is followed by the step of returning the system to the control condition disabling playback of unrated program information subsequent to completion of playback of the unrated program information.
 8. The method of claim 7 wherein step (A) is preceded by the step of determining whether user override in response to unrated program information is enabled.
 9. The method of claim 8 wherein step (C) is preceded by the step of prompting a user to enter a password needed to enable override.
 10. Apparatus for processing information stored on a storage medium comprising: means for accessing information stored on the storage medium; and control means for processing the information accessed from the storage medium for determining whether a portion of the program being played includes unrated program information, and for providing to a user in response to detection of unrated program information an opportunity to override a control condition of the apparatus preventing playback of the unrated program information.
 11. The apparatus of claim 10 wherein the control means enables playback of the unrated program information in response to user override of the control condition and wherein the control means returns the apparatus to the control condition preventing playback of other unrated program information upon completion of playback of the unrated program information.
 12. The apparatus of claim 11 wherein the control means is responsive to user entry of a password for override of the control condition to enable playback of unrated program information.
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中华人民共和国国家知识产权局

[51] Int. Cl⁷

H04N 5/93

[12] 发明专利申请公开说明书

[21] 申请号 99810560.0

[43] 公开日 2001 年 10 月 10 日

[11] 公开号 CN 1317200A

[22] 申请日 1999.7.2 [21] 申请号 99810560.0

[30] 优先权

[32] 1998.7.20 [33] US [31] 60/093,344

[32] 1998.12.31 [33] US [31] 09/223,937

[86] 国际申请 PCT/US99/15090 1999.7.2

[87] 国际公布 WO00/05883 英 2000.2.3

[85] 进入国家阶段日期 2001.2.28

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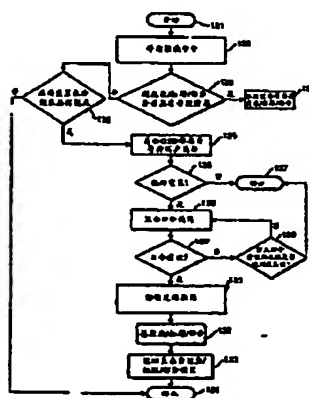
代理人 马莹

权利要求书 2 页 说明书 10 页 附图页数 10 页

[54] 发明名称 数字视频装置用户接口

[57] 摘要

一种用于处理存储在诸如数字视盘的存储介质上的信息的方法和装置,包括存取在该介质上所存的信息并且确定在存储介质上存储的信息是否包括未分级的节目信息。如果是,则向用户提供重置系统控制条件的机会,这样可以防止未分级节目信息的播放。如果选择进行重置,则启动未分级节目信息的播放,并且一旦播放结束,系统的控制条件就可以被恢复以防止其它未分级节目信息的播放。重置可根据用户首先输入一个口令来确定。



ISSN 1008-4274

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1. 一种控制用于处理存储介质上所存信息的系统的方法, 包括步骤:

5 (A) 确定存储在存储介质中的信息是否缺少用于识别存储介质上所存节目的等级的等级信息;

(B) 通过对确定所存信息缺少等级信息的响应, 向用户提供选择是否重置系统锁定的机会, 以停止存储在存储介质上的未分级信息的播放; 以及

10 (C) 通过对用户重置系统锁定的响应而启动节目的播放。

2. 根据权利要求1的方法, 其中步骤(C)之后是在节目播放结束时停止在存储介质上存储的未分级信息的播放的步骤。

3. 根据权利要求2的方法, 其中步骤(A)之前是确定是否启动用户重置系统锁定的操作模式的步骤。

15 4. 根据权利要求3的方法, 其中步骤(C)之前是提示用户输入一个重置系统锁定所需的口令的步骤。

5. 根据权利要求4的方法, 其中该系统包括DVD视盘机并且存储介质包括DVD盘。

6. 一种控制用于处理数字视盘上的信息的系统的方法, 包括步骤:

20 (A) 确定数字视盘是否包括未分级的节目信息;

(B) 在播放操作模式期间提示用户选择是否重置系统的控制条件以启动未分级节目信息的播放; 并且

(C) 通过响应用户选择重置系统的控制条件来启动未分级节目信息的播放。

25 7. 根据权利要求6的方法, 其中步骤(C)之后是在未分级节目信息的播放结束之后使系统返回至用于停止播放未分级节目信息的控制条件的步骤。

8. 根据权利要求7的方法, 其中步骤(A)之前是确定是否通过响应未分级节目信息启动用户重置的步骤。

30 9. 根据权利要求8的方法, 其中步骤(C)之前是提示用户输入一个启动重置所需的口令的步骤。

10. 用于处理存储介质上所存信息的装置，包括：

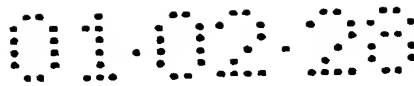
用于存取存储介质上所存信息的设备；和

5 控制设备，用于处理通过存储介质存取的信息以用于确定所播放的节目部分是否包括未分级的节目信息，并且用于通过响应未分级节目信息的检测向用户提供重置该装置控制条件的机会以防止播放未分级的节目信息。

11. 根据权利要求 10 的装置，其中控制设备通过响应用户重置控制条件来启动未分级节目信息的播放，并且其中在未分级节目信息的播放结束之后，控制设备把该装置返回至防止播放其它未分级节目信息的控制条件。

10

12. 根据权利要求 11 的装置，其中控制设备响应用户输入用于重置控制条件的口令以启动未分级节目信息的播放。



说明书

数字视频装置用户接口

- 5 本发明涉及数字视频装置的一种用户接口，并特别涉及可以通过响应与包含视频和音频信息的诸如父母控制等级信息相关的节目来限制所存视频和音频信息播放的一种数字视频装置的用户接口。

- 使用记录了数字压缩视频和音频信息的存储介质的视频信号处理系统可以向用户提供大量选项以用于控制存储于这种介质上的视频标题的
10 播放。这种得到迅速普及的系统包括一个适合于处理根据数字视盘 (DVD) 规范存储的信息的视盘机。根据适当的视频和音频压缩标准，DVD 格式化盘上的信息被作为分散的数据包而记录，其中指定的数据包具有例如可替换视频角度、声道、子图像流等与各种数据流相关的数据。读取 DVD
15 盘根据等级内容等可授权允许进行多个摄像角度、故事结局、景物的播放。利用这种能力，DVD 系统可用于防止未经授权存取特定盘上的信息，而且可根据用户命令无缝提供一个视频标题的多个变化。

- DVD 系统的限制存取及无缝转移特征的一个有益应用涉及到由指定视盘机播放的素材的父母控制。通常，DVD 视盘机允许用户选择一个父母
20 控制等级，一般是从 1 级到 8 级不等，其中 1 级限制最少而 8 级限制最多。这种用户所选父母等级用于建立系统的一个控制条件，该系统根据指定给盘或视频标题的父母等级自动限制利用视盘机所进行的视盘、视盘上的视频标题或视频标题中的景物的播放。这种父母等级通常对应于美国电影协会 (MPAA) 的电影等级。

- 25 在盘播放期间，DVD 视盘机比较用户所选父母等级和指定给视盘或视频标题的等级，而且只有用户所选父母等级等于或超过视盘或视频标题的父母等级时才允许进行视盘、视频标题或视频标题中某些景物的播放。在多种播放顺序的情况下，DVD 视盘机采用具有对应于用户所选父母等级的一种父母等级的播放顺序。

- 30 一般地，一用户必须调用视盘机的设置菜单并且通过它的导航来选择或改变用户所选的父母等级。一旦选中，用户所选父母等级就应用于



利用该视盘机播放的所有盘。

但是，上述父母控制特征在视盘、或视盘上的视频标题、或存储介质上的节目部分或信息没有与之相联系的父母等级时是无效的。在这种情况下，视盘机通常将没有任何父母等级限制地播放盘或视频标题组的内容。然而在某些情况下，用户希望限制对诸如个人记录的盘或视频标题的未分级视盘，或盘上的某些视频标题、或视盘特定部分的存取。本发明认为最好提供一种接口、方法和装置，它允许用户把有关未分级盘或视频标题或记录在存储介质上的部分信息的锁定特征用于限制对未分级信息的存取。

- 10 根据本发明提出了一种用户接口、方法和装置，它允许用户在视盘中建立与未分级盘或视频标题或部分所存信息有关的系统锁定条件，以防止该视盘机播放未分级盘或视频标题或节目或部分所存信息。该系统向用户提供动态重置系统锁定条件以解锁视盘机的机会，这样，该视盘机可以播放所选的未分级盘或视频标题或部分所存信息。在一种操作模式
- 15 中，在所选未分级盘、视频标题或部分所存信息的播放结束之后，该系统自动重建用于未分级信息的系统锁定条件以重新锁定视盘机。在另一种操作模式中，视盘机在结束未分级信息的播放之后继续保持解锁状态。

下面将参考附图描述本发明，其中：

- 20 图 1 是基于 DVD 规范的视频处理系统的框图；
图 2 是适合于实施本发明的未分级盘锁定特征的数字视盘机的框图；
图 3 是表示视盘机区域和 DVD 区域间的导航的框图；
图 4 是表示视盘机区域和 DVD 区域间的导航的详细框图；
25 图 5 是提供视盘机和盘状态信息的屏幕信息显示的例子；
图 6 是基于 DVD 格式的数据结构的示意图；
图 7 是基于 DVD 格式的代表结构的框图；
图 8a-b 是表示在 DVD 格式中可用的样本播放选项的框图；
图 9 是适用于重置本发明的未分级盘锁定特征的屏幕显示；
30 图 10 是表示用于实施动态重置本发明的未分级盘锁定特征的步骤的流程图；并且



图 11 是表示用于实施动态重置本发明的未分级盘锁定特征的一个实施例的步骤的流程图。

尽管典型实施例的描述所参考的是适合于从视盘读取被压缩的视频和音频数据并根据 DVD 规范处理数据的数字视频装置，应当理解的是，
5 本发明可用于能够处理数字视频和音频信息的任何视频处理装置中，其中与包含视频和音频信息相关信息的节目可用于有选择地限制盘上视频和音频信息的播放。

另外，应当理解术语“未分级盘锁定”指的是锁定视盘机以防止未分级盘和/或未分级视频标题的播放。

10 图 1 是基于 DVD 规范的视频处理系统 20 的框图。具体来说，图 1 示出了包括视盘机 24 和 DVD 格式化盘 21 的视频处理系统 20 中表示数据和导航数据间的基本关系。根据来自用户控制装置 31 的命令，盘 21 的内容由视盘机 24 读出并显示在显示器 28 上。盘 21 包括表示数据 22 和导航数据 23，其中表示数据 22 包括将要以视频、音频、子图像等形式播放的数据，并且导航数据 23 包括用于确定如何显示表示数据 22 的控制数据。
15 盘 21 还可包括用于产生菜单的数据，以允许用户交互控制表示数据 22 的显示方式。

视盘机 24 包括表示引擎 25 和导航管理器 26，它们可在参考图 2 所述的微控制器 40 中实施。表示引擎 25 接收表示数据 22，并且在导航管理器 26 的控制下向显示器 28 提供输出。显示器 28 包括音频输出装置 30
20 和视频显示器 29。导航管理器 26 包括用户接口控制 27，它提供用户接口，创建菜单等。导航管理器 26 使用来自导航数据 23 的信息来控制表示引擎 25 对显示器 28 的输出。用户控制装置 31 与导航管理器 26 连接并且允许用户输入数据以控制导航管理器 26 控制表示引擎 25 的方式。

25 图 2 是表示一种典型数字视盘机的基本部件的框图，该数字视盘机适用于图 1 所示系统 20 并用于执行本发明的未分级盘锁定特征。这些部件的构造和操作对于本领域的普通技术人员来说是已知的，因而在此将不再对其进行详细讨论。视盘机 24 包括电机和拾取组件 26，它在伺服处理器 29 的控制下旋转该盘并读取其中所存的信息。前置放大器 27 和 DVD
30 数据处理单元 28 把来自电机和拾取组件 26 的电脉冲转换为可由数字音频/视频解码器单元 30 进一步处理的数字数据。DVD 数据处理单元 28 通



常对从视盘读出的原始数据执行诸如解调、误差校正和解扰的操作，以使数据处于一种可用于解码器单元 30 的适当格式。

解码器单元 30 接收经过了解调、误差校正和解扰的数据并处理该数据，并且向诸如电视机的显示单元提供合适的视频和音频信号。解码器单元 30 包括数据流分路器 32，它把来自数据处理单元 28 的数据多路分为包括视频流、音频流和子图像流的多个独立数据流，并且把这些数据流提供给他们各自的数据解码器。视频解码器 31 接收视频流并提供视频信号给混合器 33。子图像解码器 34 接收子图像流并把数据提供给屏幕显示 (OSD) 控制 35，OSD 控制 35 把 OSD 视频信号提供给混合器 33。来自混合器 33 的组合视频信号提供到 NTSC/PAL 编码器 42，编码器 42 把符合适当的视频信号标准的视频信号提供给视频显示装置。音频解码器 36 接收来自数据流多路分离器 32 的音频流，并把合适的音频信号提供给音频系统。

微控制器 40 控制视盘机 24 的操作。微控制器 40 与可包括 IR 遥控装置、前面板按钮等的用户控制装置 41 连接，并且转换来自用户控制装置 41 的数据以控制上述视盘机 24 的各个部件的操作。通常，微控制器 40 还用于控制视盘机 24 的各种存取特征以便能够存取受保护的盘，其中视盘机 24 的各种存取特征包括但又不限于父母锁定、加密盘的解密和对远程控制器进行拨号以存取加密盘。微控制器 40 可以体现为各种不同形式，包括但又不限于专用集成电路、或解码器/控制器单元的一部分。微控制器 40 可由多种合适的控制器单元中的一种组成，该控制器包括但又不限于 SGS Thomson 生产的 STI 5500。

图 3 表示视盘机区域 60 和盘区域 62 间的基本导航示意图。输入 PLAY 命令或调用导航数据可将控制移动到盘区域 62，其中标题播放如标题播放框 63 所指示的一样来执行或者标题菜单如标题菜单框 64 所指示的一样进行显示。通过标题菜单进行屏幕选择可控制播放顺序。STOP 命令可使用户返回到视盘机区域 60。

图 4 更详细地示出了视盘机区域 60 和盘区域 62 间的导航示意图。如图 4 所示，视盘机区域 60 包括视盘机菜单 61，它允许用户选择视盘机的某些操作条件，如父母控制等级。而且，DVD 区域 62 包括标题菜单 64，用于提供有关相应视频标题的信息。通过标题菜单 64 进行屏幕选择可使



用户转入标题播放框 63, 它包括提供根菜单 65。根菜单 65 可被制作于盘上以提供有关盘上可用选项的信息, 其中可用选项包括但又不限于副标题、声道和摄像角度。

如果该盘不包括可在该盘上制作的根菜单 65, 则最好通过存储于该盘上的实际视频和音频信息产生一个信息显示, 它识别并显示用户可用选项。这种信息显示的提供由信息显示框 66 指示。图 5 示出了信息显示 75 的例子, 当根菜单 65 不能通过 DVD 区域 62 获得时, 信息显示 75 可用于识别并向用户显示盘上可用的选项。另外, 即使根菜单 65 存在于 DVD 区域 62 中, 视盘机 24 也允许用户选择信息显示 75 而不是根菜单 65。

如图 5 所示, 信息显示 75 包括文本显示部分 76, 它由用于提供有关盘内容的信息并允许用户进行各种选择以控制各种盘播放方案的多个显示和按钮 77-87 围绕。定时器显示 77 提供有关被播放盘的时间信息, 并且传送显示 78 表示盘驱动的方向和速度。按钮 79 用以存取关于当前标题号的信息。按钮 80 用以存取关于当前章节号的信息。按钮 81 允许用户改变视盘机 24 的播放模式设置。按钮 82 允许用户存取盘的根菜单。按钮 83 用以存取关于盘上副标题的信息。按钮 84 允许用户从可用音频流中选择。按钮 85 允许用户从可用摄像角度中选择。按钮 86 允许用户从可用重复模式中选择。按钮 87 允许用户设置书签或跳变到先前设置的书签。

图 6 表示基于 DVD 规范且适于在视频处理系统 20 中使用的数据结构。该数据结构是分层的, 其中每个数据块被分为子数据块, 它们进而再分为更小的子数据块。分层结构的顶部是视频管理器块和一个或多个视频标题组。视频管理器包括控制数据块和盘菜单, 其中控制数据块具有适用于盘的控制信息。每个视频标题组对应于一个指定的节目单元, 如一部电影或一段电视节目。

每个视频标题组包括具有用于该视频标题组的控制信息的控制数据块、标题菜单、之后的标题内容和控制数据备用块。标题菜单和标题内容均由视频目标组组成, 其中每个视频目标组包括多个视频目标。每个视频目标由多个单元组成, 每个单元则由多个视频目标单位组成。每个视频目标单位由一个导航数据包和多个数据包组成, 它们被再分为多个数据小包。最小的可寻址数据块是单元, 其中一个单元所容纳的节目短

至一个景物或长至整部电影。

在实施父母控制特征时，父母控制等级可在视频管理器中编码以控制存取整个盘或者可在每个相应视频标题组的控制数据块中编码以控制存取特定的视频标题组。如果父母控制等级在视频管理器中编码，则视
 5 盘机 24 仅仅在用户所选父母等级等于或超过在视频管理器块中编码的父母等级时才允许适当的视盘播放。如果在视频标题组的控制数据块中编码父母等级，则视盘机在该视频标题组播放之前检查每个视频标题组的父母等级。本发明相对于编码父母等级的关系将在下面作进一步讨论。

图 7 示出了基于 DVD 格式且适于在视频处理系统 20 中使用的表示结
 10 构。该表示结构被重叠在图 6 所示的数据结构上。表示结构和数据结构在单元级上会聚。如图 7 所示，每个视频标题组可由多个父母块 90 组成，其中每个父母块由一个或多个节目链 (PGC) 92 组成。每个节目链包含节目链信息块 94 和视频目标组 96。节目链信息块 94 包括一个或多个节目 (PG) 96，每个节目都包括指向在视频目标组 96 的各个视频目标 100 中包
 15 含的单元 98 的指针的集合。节目 96 把单元 98 链接在一起并且指出它们的播放顺序。因此，通过向希望的单元提供适当的指针，节目链 92 提供特定的播放顺序并且节目链 92 的集合提供视频标题组的播放顺序。由此可见，可以创建多个父母块以产生对应于不同父母控制等级的多种播放顺序，其中每个父母块均包含不同的节目链。

20 对应于不同父母控制等级的视频标题组的不同版本可由盘作者提供以使视盘机 24 在各种景物间无缝转移，从而为一个特定视频标题组提供多种播放顺序。通过把用户所选父母等级设置为低等级，可以让年轻观看者跳过不良景物，同时通过把用户所选父母等级设置为高级别可以使成年观看者观看未编辑的节目版本。根据需要链接并显示所希望的单
 25 元、节目和节目链可以实现无缝转移。图 8a-b 示出了通过节目链组之间的无缝转移所提供的单一播放顺序和多种播放顺序。在图 8a 中，视盘仅仅准备了包括节目链 #1 的单一播放顺序，其中播放以一个连续的顺序进行。图 8b 中提供了多种播放顺序，其中 G 级播放顺序将沿节目链 1, 2, 4 和 7 而行，而 PG 级播放顺序将沿节目链 1, 3, 5 和 8 而行，并且 R 级播
 30 放顺序将沿节目链 1, 3, 6 和 9 而行。

如上所述，通过完全避免根据在视频管理器中编码的父母等级对盘

的存取或者完全避免根据在视频标题组的控制数据块中编码的父母等级对视频标题组的存取也可以执行父母控制。在该情况下，视盘机 24 比较用户所选父母等级和编码的父母等级，并且确定是否允许盘或视频标题组的播放。如果用户所选父母等级等于或超过盘或视频标题组的父母等级，则视盘机 24 播放所选盘或视频标题组。如果用户所选父母等级低于盘或视频标题组的父母等级，则视盘机 24 避免该盘或视频标题组的播放。

如上所述，本发明认识到，上述父母控制特征在视盘或视频标题组没有分级或者没有与之相联系的父母等级时不能应用。本发明进而认识到，用户可能希望把父母控制特征应用到未分级盘或视频标题组以防止这种盘或视频标题组的播放。因此，视盘机 24 向用户提供与未分级盘或视频标题组有关的锁定视盘机 24 的选项。这种选项能够以若干种方式来实施，这些方式包括但又不限于在视盘机设置的菜单中、在父母控制设置子菜单中提供选项，以针对未分级盘和/或视频标题组锁定视盘机 24。如已有技术可知那样，设置菜单可在微控制器 40 的控制下产生。选择这种选项的方式最好与用户选择用于视盘机 24 的特定父母等级的方式相同。一旦选定了未分级盘锁定特征，视盘机 24 的控制系统就建立一个系统控制条件，它自动锁定或防止所有没有与之相联系的父母等级的盘或视频标题组的播放。

但是，在选择了未分级盘锁定特征之后，用户可能希望在所选盘或视频标题组的播放期间动态重置该锁定特征。在这种情况下，用户可能希望避免下面的这种不便之处，即不得不停止播放盘，调用视盘机设置菜单并通过其导航以停用锁定特征，播放盘或视频标题组，随后在播放结束之后还原未分级盘锁定特征。因此，本发明还允许用户动态重置未分级盘锁定特征，其中视盘机 24 在所选盘或视频标题组的播放结束之后自动还原未分级盘锁定特征。

图 9 所示为用于提示用户重置未分级盘锁定特征的适当的屏幕显示。显示 110 指出所选盘或视频标题组是未分级盘或视频标题组，而且指出未分级盘锁定特征必须被重置以播放所选盘或视频标题组。显示 110 让用户选择按钮 112 以重置未分级盘锁定特征并选择按钮 114 来取消当前的选择。两个按钮间的选择和导航可使用任何一种传统的已知用户接



口方法来执行，例如使用光标控制按钮和遥控器上的 ENTER 键。

如果用户选择按钮 112 接收重置选项，则视盘机 24 显示口令询问。这个口令询问可采取多种形式，包括但又不限于在视盘机 24 初始设置时输入用户所选的数字代码。如果用户成功通过口令询问，视盘机 24 则自动重置未分级盘锁定特征并且重新播放所选盘或视频标题组。如果用户选择取消选择按钮 114，则视盘机 24 停止盘播放并且等待另外的命令。应当理解的是，上述用户接口可使用本领域普通技术人员已知的技术来实施，例如，对微处理器 40 编程来实施各种步骤。

图 10 是表示用于实施动态重置未分级盘锁定特征的步骤的流程
10 图：在步骤 122，视盘机 24 等待用户发出 PLAY 命令并且一接到 PLAY 命令就搜索盘或视频标题组的与该盘或视频标题组相联系的父母等级。如果视盘机 24 在步骤 123 确定该盘或视频标题组包括一个父母等级，则视盘机 24 在步骤 124 根据该父母等级播放所选盘或视频标题组。

如果视盘机 24 在步骤 123 确定所选盘或视频标题组未包括一个父母
15 等级，则视盘机 24 显示如图 9 所示的屏幕显示信息，并且等待用户的响应。如果视盘机 24 在步骤 126 确定选择了取消选择选项，则视盘机 24 前进到步骤 127 并等待进一步的用户命令。

如果视盘机 24 在步骤 126 确定用户已选择了重置选项，则视盘机 24 在步骤 128 发出一个口令询问。如果视盘机 24 在步骤 129 确定用户输入的口令不对，则视盘机 24 在步骤 130 确定输入口令的尝试次数是否达到
20 最大值。如果是，则视盘机 24 在步骤 127 停止播放盘并且等待进一步的命令。如果不是，则视盘机 24 在步骤 128 再次发出口令询问并等待用户输入另一个口令。另外，视盘机 24 可允许在预定的时间周期内或在时间与尝试次数的某种组合之内进行口令尝试。

25 如果视盘机 24 在步骤 129 确定口令正确，则视盘机 24 在步骤 131 重置未分级盘锁定特征并且播放盘或视频标题组。在步骤 133，一旦未分级信息的播放结束，系统就还原未分级信息锁定特征。利用这种方式，用户不需要调用视盘机设置的菜单并通过其导航就可以重置所选盘或视频标题组或部分所存信息的未分级盘锁定特征，并在播放结束之后还原
30 该锁定特征。但是，对图 10 的方案进行改进也是可能的。具体来说，步骤 133 可以是任选的。也就是说，在一个实施例或模式中，如步骤 133

所示，一旦播放结束就可以如上所述还原系统。在另一个模式或实施例中，在执行了重置的未分级盘、标题、节目或部分信息的播放结束之后，通过重置操作创建的未分级信息的解锁条件可以被继续保留。在设置期间通过设置希望的模式，例如通过使用遥控器从模式和选项菜单所示的
5 屏幕显示中选择希望的特征可以实现对确立是否需要步骤 133 的模式的控制。

图 11 以流程图的形式表示一种用于控制根据本发明原理的系统的另一个实施例。图 11 中与图 10 具有相同参考数字的步骤以类似于上述图 10 中的相应步骤的方式操作，并且在此将不再对其进行详细描述。
10 图 11 所述方案可保证有选择地启动用户重置未分级信息锁定特征的操作模式。具体来说，图 11 包括步骤 123 之后的步骤 135，它测试确定是否启动未分级锁定重置的模式。如果是（在步骤 135 回答“是”），则步骤 135 之后是步骤 125，并且与图 10 所述的情况一样继续操作以重置未分级锁定控制条件。如果不能启动未分级锁定重置（在步骤 135 回答
15 “否”），则步骤 135 之后是步骤 134，这样则没有向用户提供重置未分级信息锁定的机会就退出了处理程序。如果用户需要，则可以在播放模式启动之前通过上述普通设置菜单的导航来进行重置。

未分级信息重置模式的启动/停用可在设置操作模式期间通过选择由系统的屏幕显示处理器创建的设置选项显示上的希望模式来进行。除了运转中 (on-the-fly) 重置模式的启动/停用，诸如通过按动遥控器上的
20 控制按钮还可启动设置操作模式，该模式能够控制各种特征，如视频处理特性、声音特性、闭合字幕说明等。利用遥控器上的按钮，可以从显示的设置菜单中选择希望的特征/模式/设置。

本领域的普通技术人员容易理解，尽管本发明是根据典型实施例来描述的，但在不背离本发明实质的情况下可以对公开的实施例进行改进
25 和变化。

这里应当认识到，未分级盘锁定特征可以使用若干传统已知方法中的任意一种方法，或方法的组合来执行，用于诸如使用微控制器中内置的软件控制上述视盘机 24 的各种部件。而且，本发明的未分级盘锁定特
30 征可执行用于通过响应父母控制等级或其它节目相关信息的存在而有选择地限制存取的任何信号处理系统，其中节目相关信息与存储在包括视

01.02.28

频磁带、DVD 视频系统、DVD 音频系统、DVD-ROM 系统、激光盘系统等
存储介质上的所存音频、视频和子图像数据包含在一起。因此可以理解，
本发明涵盖了本发明宗旨和范围之内所有改进。

说明书附图

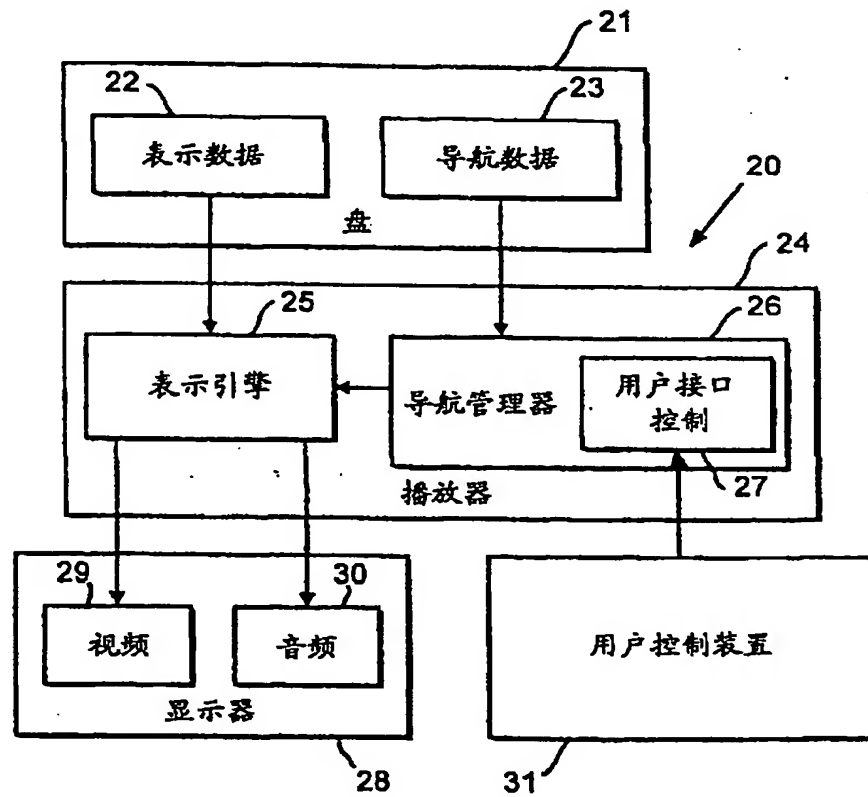


图 1

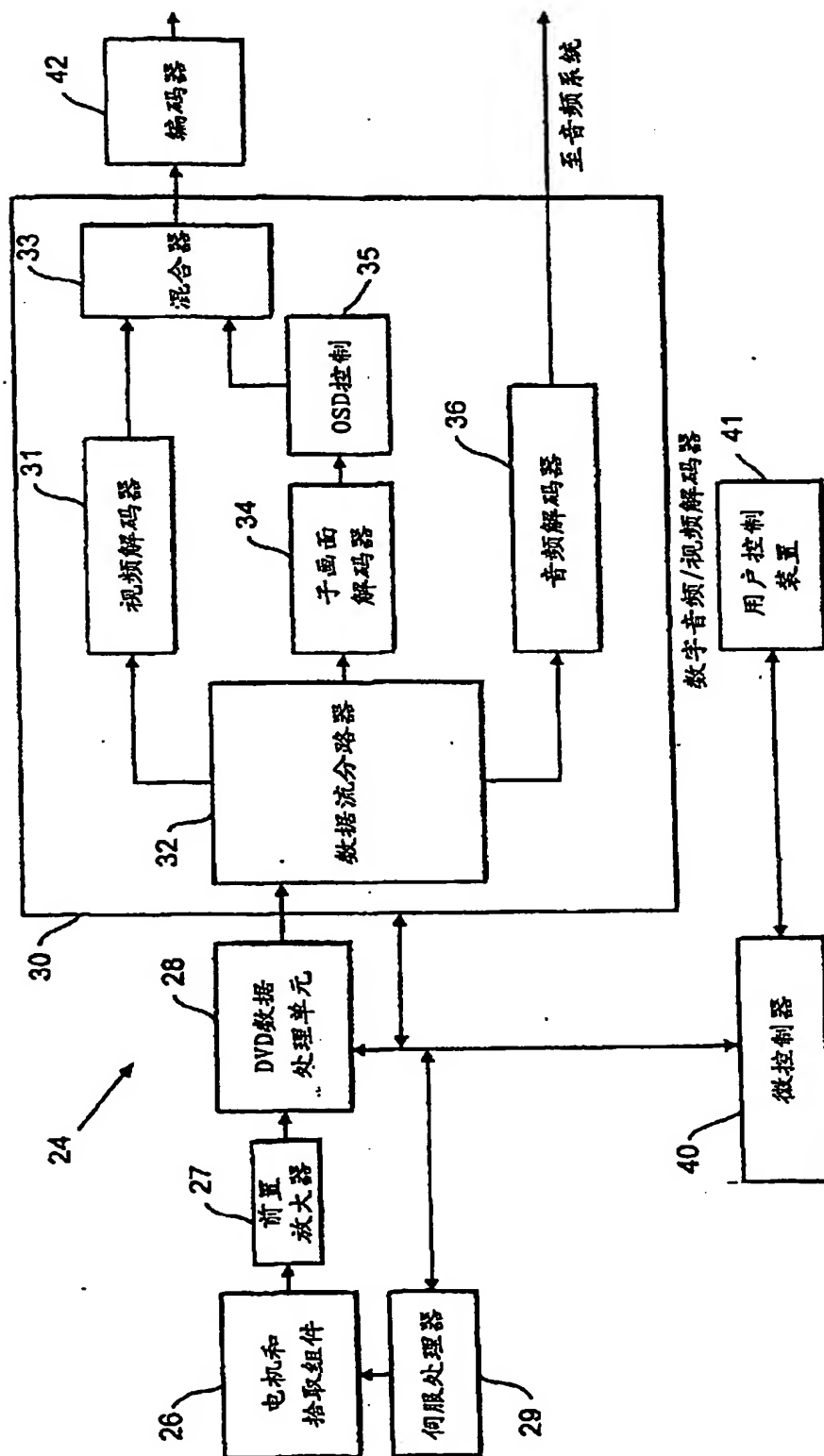


图 2

01:02:28

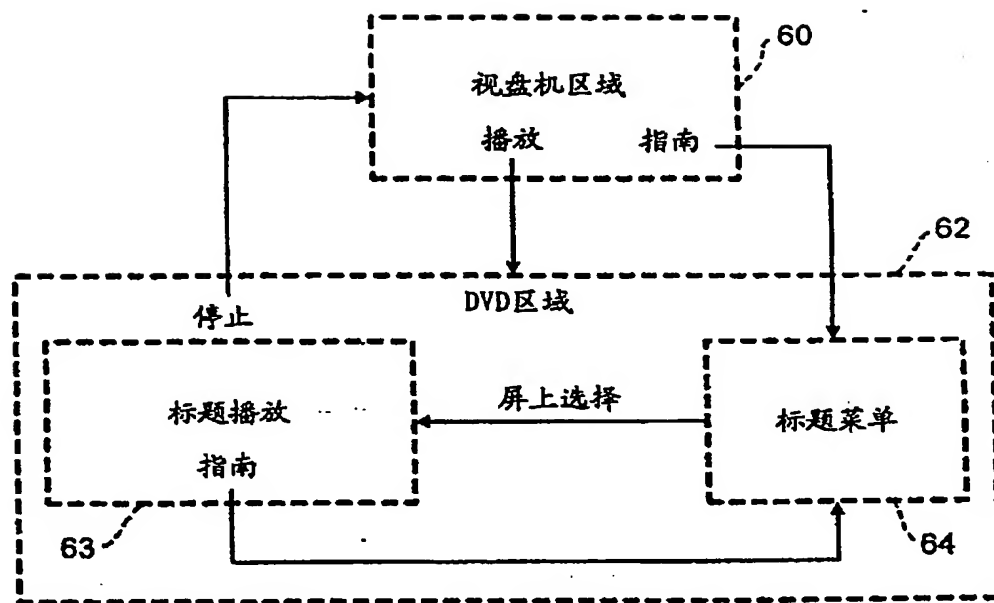


图 3

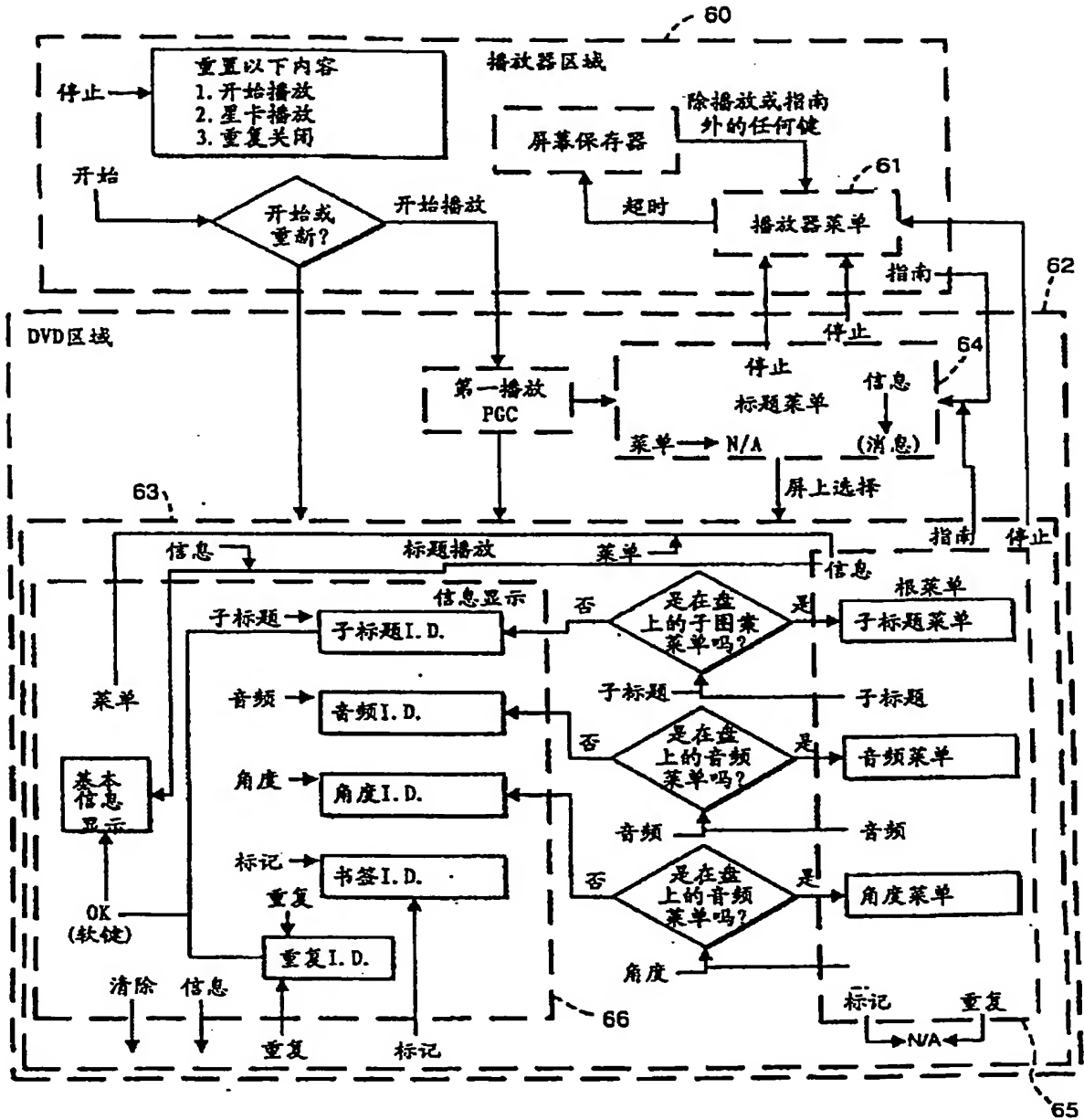


图 4

01:00:28

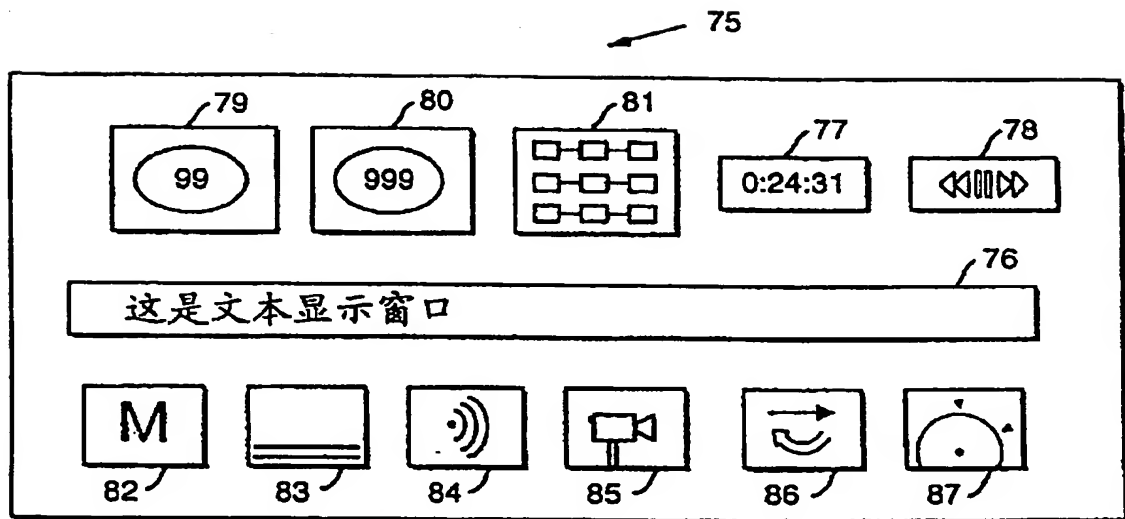


图 5

01.02.28

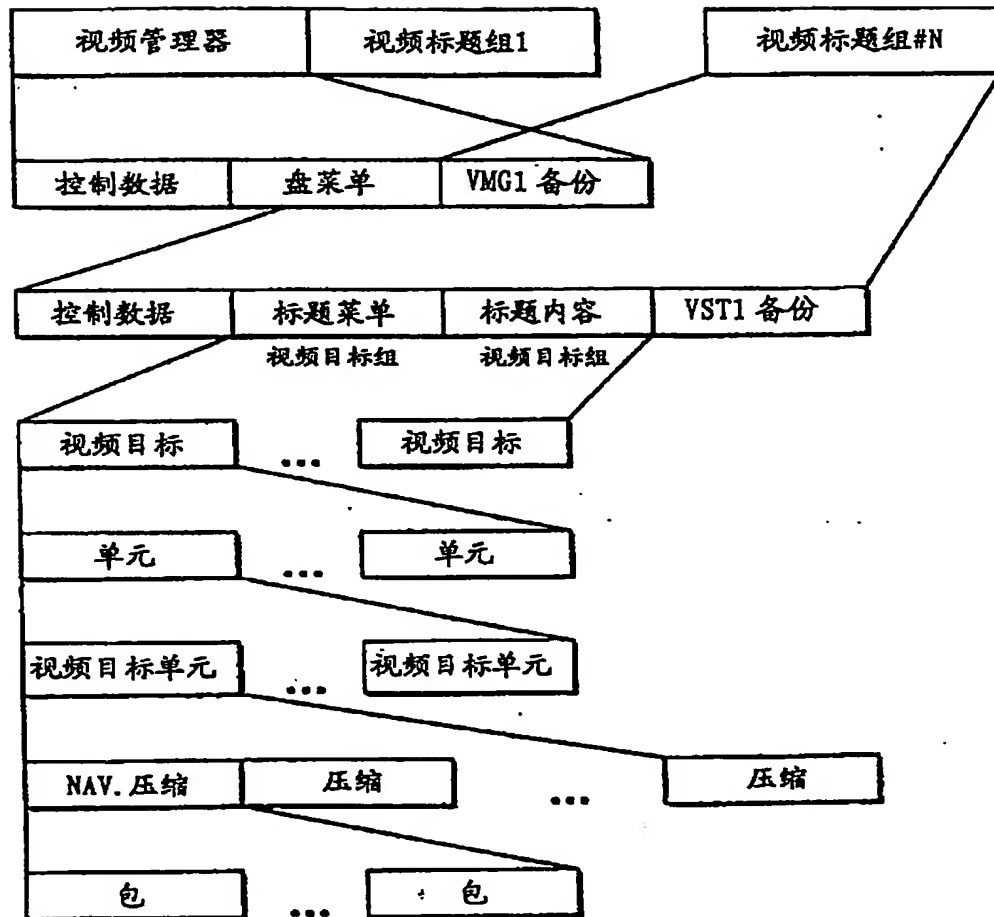


图 6

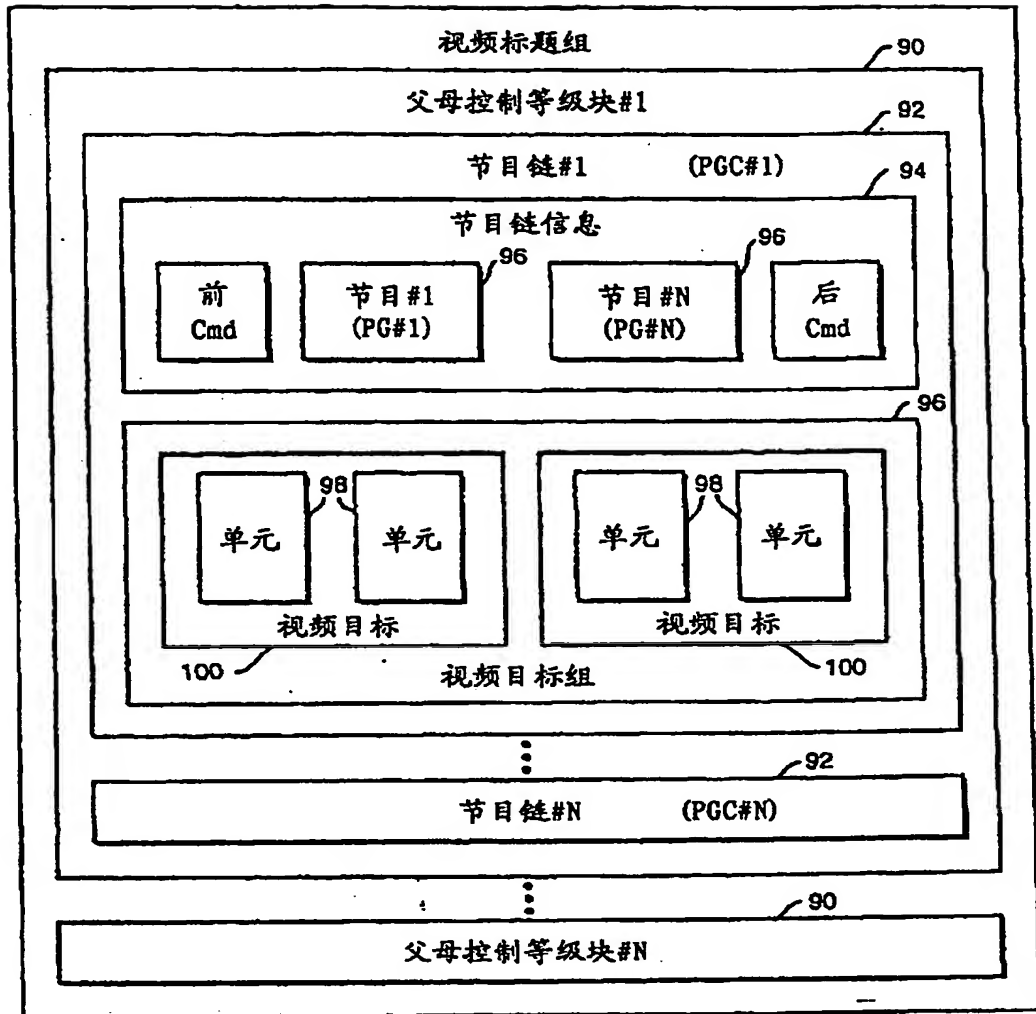


图 7

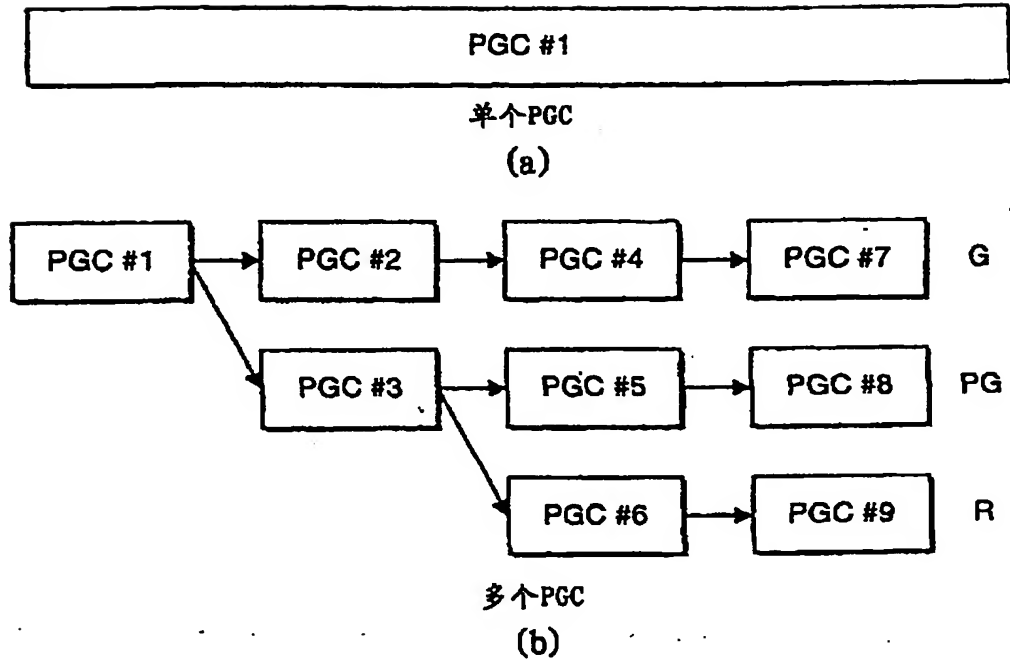


图 8

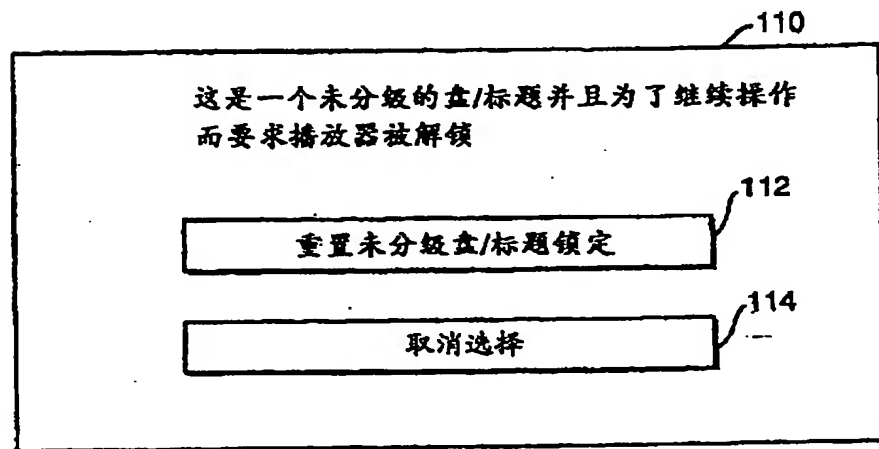


图 9

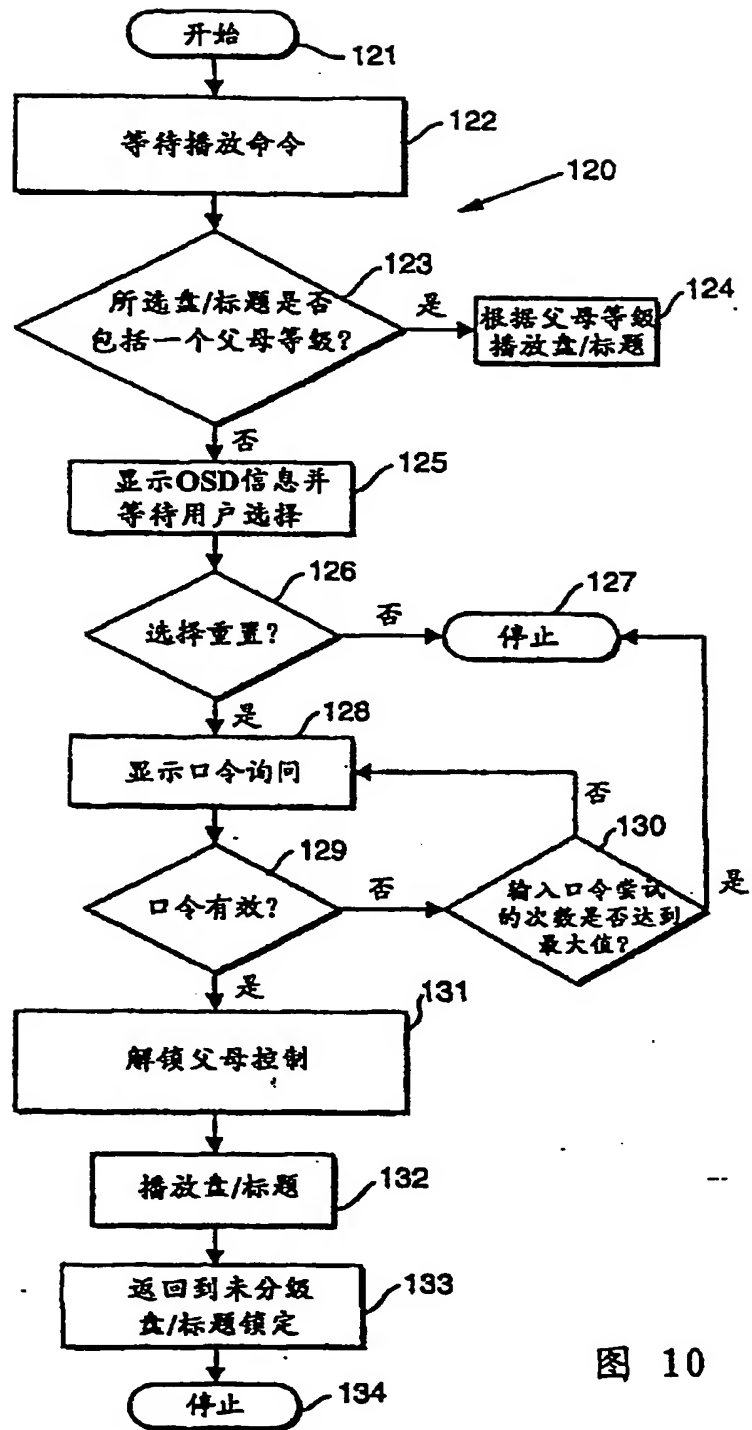


图 10

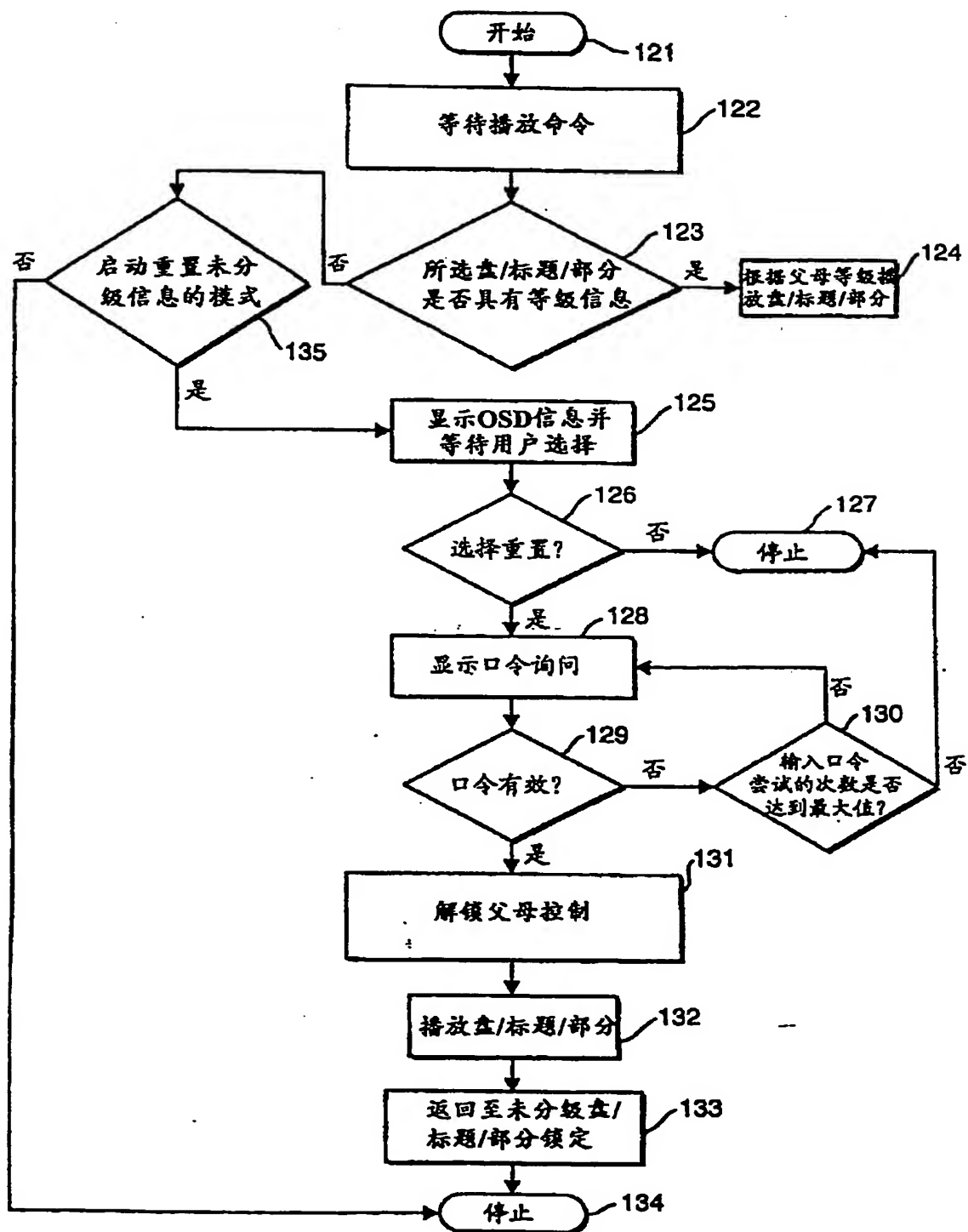


图 11